Name: _____

GCSE (1 – 9)

Similar Shapes (Area and Volume)

Instructions

• Use **black** ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
• You must **show all your working out.**

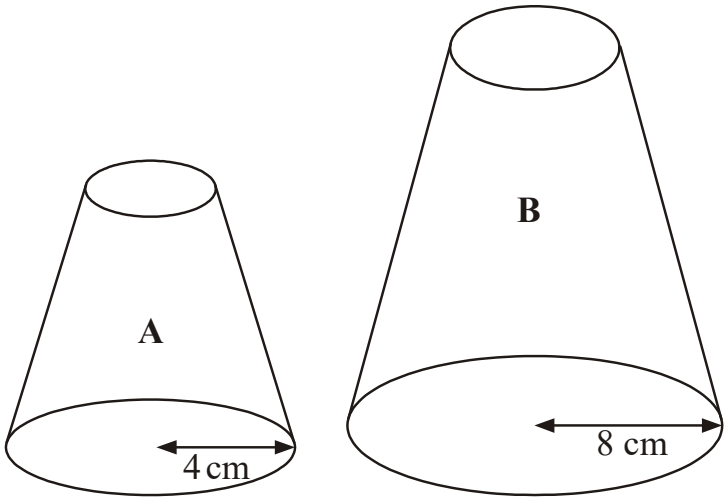
Information

• The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end

1



Two solid shapes, A and B, are mathematically similar.

The base of shape A is a circle with radius 4 cm.
The base of shape B is a circle with radius 8 cm.
The surface area of shape A is 80 cm^2.

(a) Work out the surface area of shape B.

..... cm^2

(2)

The volume of shape B is 600 cm^3.

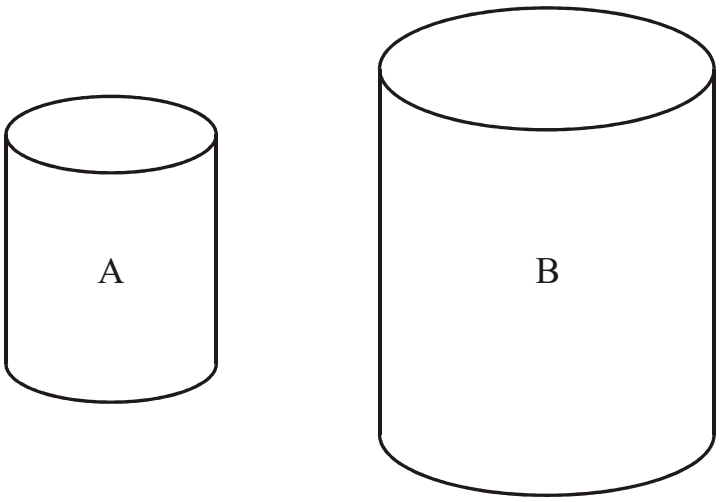
(b) Work out the volume of shape A.

..... cm^3

(2)

(Total for Question 1 is 4 marks)

2



The two cylinders, A and B, are mathematically similar.
The height of cylinder B is twice the height of cylinder A.

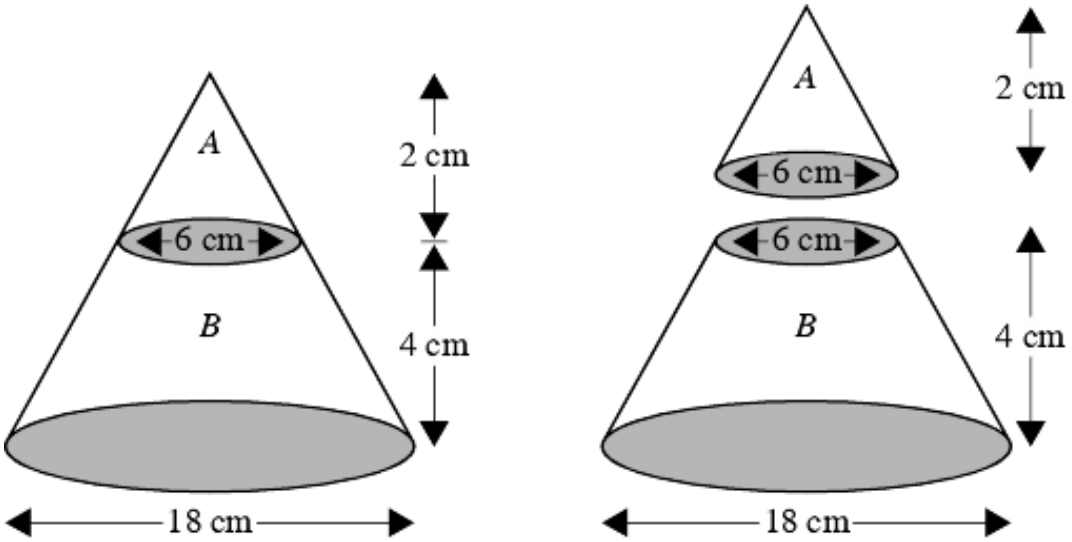
The total surface area of cylinder A is 180 cm^2

Calculate the total surface area of cylinder B.

..... cm^2

(Total for Question 2 is 3 marks)

3



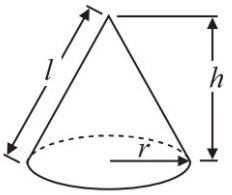
The diagram represents a large cone of height 6 cm and base diameter 18 cm.

The large cone is made by placing a small cone A of height 2 cm and base diameter 6 cm on top of a frustum B.

Calculate the volume of the frustum B.
Give your answer in terms of π.

Volume of cone = $\frac{1}{3}\pi r^2 h$

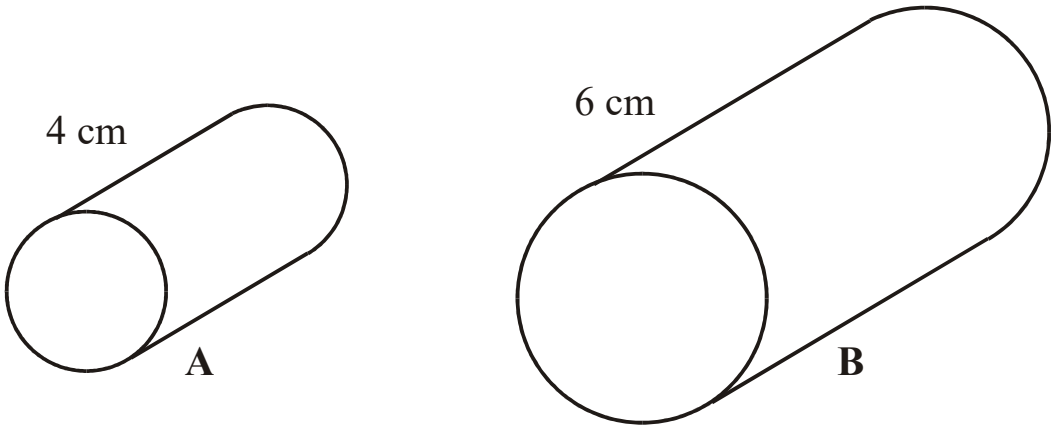
Curved surface area of cone = $\pi r l$



.....cm^3

(Total for Question 3 is 4 marks)

4



Cylinder A and cylinder B are mathematically similar.
The length of cylinder A is 4 cm and the length of cylinder B is 6 cm.
The volume of cylinder A is 80 cm^3.

Calculate the volume of cylinder B.

..... cm^3

(Total for Question 4 is 3 marks)

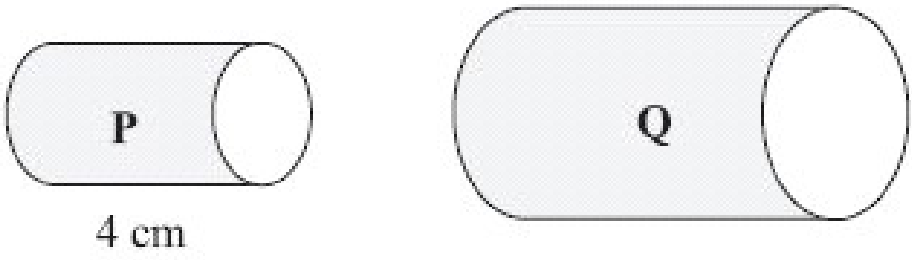
5 Cylinder A and cylinder B are mathematically similar.
The length of cylinder A is 4 cm and the length of cylinder B is 6 cm.
The volume of cylinder A is 80 cm^3.

Calculate the volume of cylinder B.

..... cm^3

(Total for Question 5 is 3 marks)

6



Two cylinders, P and Q, are mathematically similar.

The total surface area of cylinder P is 90π cm^2.
The total surface area of cylinder Q is 810π cm^2.
The length of cylinder P is 4 cm.

(a) Work out the length of cylinder Q.

.....cm

(3)

The volume of cylinder P is 100π cm^3.

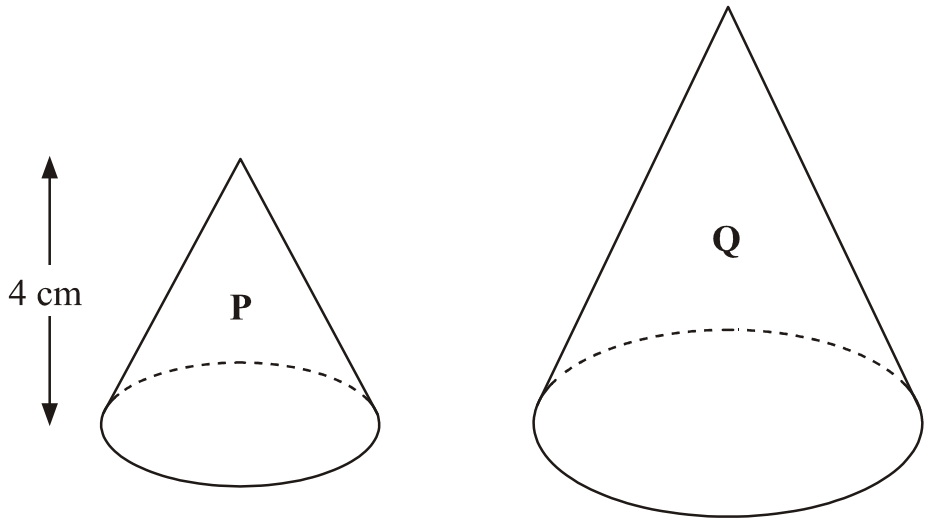
(b) Work out the volume of cylinder Q.
Give your answer as a multiple of π.

.....cm^3

(2)

(Total for Question 6 is 5 marks)

7



Two cones, P and Q, are mathematically similar.
The total surface area of cone P is 24 cm^2.
The total surface area of cone Q is 96 cm^2.
The height of cone P is 4 cm.

(a) Work out the height of cone Q.

.....cm

(3)

The volume of cone P is $12cm^3$

(b) Work out the volume of cone Q.

.....cm^3

(2)

(Total for Question 7 is 5 marks)